"It Was Chaos"

Larry Chandler

When the 1989 earthquake hit Livermore, the Laboratory was much better prepared as a result of lessons learned during the 1980 quake.

In the 1980 earthquake, the Lab had five firefighters, two fire trucks, one ambulance, 67 injuries, and millions of dollars worth of damage to facilities. And when it was all over, I went back to the fire chief and said, "This isn't going to work."

It was a 5.3-magnitude quake on the Greenville fault, about 3 miles from the Lab. The nearby overpass out on Greenville Road dropped 18 inches. We had gridlock on Greenville Road such that you couldn't go north or south. We had gridlock on East Avenue, because employees at Sandia were bailing out at the same time we were.

Emergency workers congregated at the Fire Department dispatch room, which was about as big as a cubicle. Everyone was trying to get in there to find out what was going on. It was chaos, absolute chaos.

There weren't any assembly points. There was no command center. There were no maps on where to go. No way to get instructions to employees about roads that are closed. There was nothing. Health Services was ill-prepared to deal with the injuries. So we, as firefighters, were doing a lot of first aid out in the field. There was no coordination between the Security people who were doing searches and the fire people, who were doing searches, too. We were searching buildings after Security had searched them, and then Security was searching them after we had searched them. There were no protocols. Nobody even had thought about it, including me.

We were just overwhelmed. Yet, we couldn't put our heads in the ground and say, "Forget it!" We had a job to do. But, you know, we all agreed afterward, "We can't do all of this." We have mutual aid agreements with the city and the county, but when the Earth moves like that, you don't get any help, because they have their own set of problems. So you're here, and you deal with what you've got.

A lot of the emergency preparedness activities you see here today are a result of that earthquake. Everything's changed. We started an EMT program, which has evolved into the paramedic program. The Emergency Management Center at Building 313 came about as a result of what happened. They established satellite Emergency Management Centers, so that there's now coordination if something happens. And you can attribute that to lessons learned.

Nine Years Later

Don Nelson

During the Loma Prieta earthquake (October 17, 1989), I was working overtime one evening at the Lab, and I was probably in one of the safest places to be on site during an earthquake. I was assisting physicist Ted Perry with the alignment of a diagnostic instrument on the 10-beam target chamber inside the Nova facility. We were both standing on a vertical access ladder prior to a full system shot, when the entire 16-foot-diameter target chamber began to move up and down and shake. For a few seconds, we just looked at each other and then finally realized that we were riding out a really big earthquake on a facility that was designed to survive this very kind of rocking and rolling action.

When the noise stopped and the dust settled, we climbed down off the ladder to the main operations deck. Ted said to me calmly, "I think we should leave the building now and go home." I later found out that the foundation of the Nova chamber was designed with a hinge mechanism that allowed it to move as the Earth moved, thus preventing serious mechanical damage. Within days, Nova was up and running again.

Left: Chemistry room damage.
Above: Toppled bookshelves in the library.

An Argument for Dress Rehearsals

Fred Kloverstrom

In the early 60s, the really big deal at the Lab was when the UC Regents came to visit. They are very prominent people, so a good impression was desirable.

We went all out with exhibits and demonstrations, and it was decided to demonstrate a burst from a prompt-burst reactor, in our case a system called Kukla. Kukla was an all-uranium-metal sphere, about 7 inches in diameter, and weighing about 100 pounds.

The system could be viewed through a 3-foot-thick window of water, which serves also as a radiation shield. This window was about 30 inches wide and 20 inches high, so the dozen or so visitors had to cram together to watch the blue flash that would indicate the radiation burst. The control room was crowded enough that I had to stand on an inverted wastebasket to explain what was going to happen. Or what I hoped would happen.

The operator, in this occasion a relatively new employee, had the duty of pushing the appropriate button when I gave the count. Before starting, I turned off the lights for dramatic effect. I then counted "3, 2, 1" slowly, but after "1," nothing happened.

I announced "Restart!" and counted "3, 2, 1" again. Again, nothing.

Frustrated, I announced that we had a problem and turned on the lights, at which time the operator found the right button, pushed it, and the burst went off, albeit almost invisibly because of the brightly lit control room. He had been pushing on a panel screw.

I doubt that the regents were impressed. I wanted to drop through the floor.

An Environmental Win

Bob Bainer

On September 3, 1997, just as construction on the National Ignition Facility was beginning, construction workers unearthed about 75 buried 55-gallon drums and a cache of electrical capacitors containing polychlorinated biphenyls (PCBs).

PCBs are known to be hazardous to human health and the environment at extremely low levels. They decompose very slowly and are characterized by bioaccumulation and biomagnification. Labels on the capacitors indicated that they were probably buried in the mid-1960s, which was common practice during that era. The capacitors were found under 10 to 15 feet of soil as if stacked and buried in place. The integrity of the capacitors had been compromised by rusting, and many were leaking when excavated.

The primary objective was to safely and quickly remove the PCBs to eliminate potential exposure to on-site workers. Within 9 days, 112 capacitors and about 766 tons of PCB-contaminated soil were removed and managed as hazardous waste.

The cleanup was initiated as an Emergency Removal Action, with regulatory approval within 24 hours after the discovery of the capacitors. The Lab's Environmental Protection and Hazards Control departments were called in to assess the problem and remove the contamination following appropriate regulatory requirements. The cleanup was a joint effort between the Environmental Restoration Division, the Operations and Regulatory Affairs Division, the Hazardous Waste Management Division, Hazards Control, and Plant Operations, working closely with the NIF project. The final cleanup reduced the PCB content of the soil to levels that posed no health threat to workers, the public, or the environment and was approved by all of the regulatory agencies.

A Laboratory technician verifies that old electrical capacitors, unearthed during the construction of NIF, had been discharged prior to their disposal.